CLAIMS

WHAT IS CLAIMED IS:

1. A diagnostics system comprising:

a flexible patch having an adhesive portion and adapted to be positioned on a surface;

a radio frequency identification (RFID) tag and sensor module integrated with said patch and having an antenna, an RFID electronic chip, and at least one sensor, said RFID tag and sensor module responding to a stimulus by wirelessly transmitting and receiving, through the use of said antenna, signals that correspond to said stimulus; and

a wireless RFID reader adapted to communicate through the use of multiple protocols with said RFID tag and sensor module, said RFID reader being adapted to communicate over a network through the use of multiple communication protocols.

2. A system according to claim 1, wherein a substantial portion of said RFID tag and sensor module is integrated onto a substrate disk.

3. A system according to claim 2, wherein said substrate disk includes a protective layer attached thereto, said protective layer being in direct contact with the surface when said patch is positioned on the surface.

4. A system according to claim 3, wherein said protective layer is formed of a semi-permeable material that is adapted to react to said stimulus from said surface.

5. A system according to claim 1, wherein said RFID tag and sensor module comprises:

a sensor interface having an analog to digital converter coupled to said at least one sensor; and

a controller communicative with said sensor interface, said controller having a memory with a sensor data table being adapted to analyze said at least one sensor within said RFID tag and sensor module.

6. A system according to claim 5, wherein said controller stores a sensor identification number in said sensor data table.

7. A system according to claim 5, further comprising a temperature sensor communicative with said controller.

8. A system according to claim 1, wherein responding to said stimulus includes sensing electrical, chemical, biological, and physical elements of said surface.

9. A system according to claim 1, wherein said RFID reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer.

10. A system according to claim 1, wherein said surface is the skin surface of a person.

11. A system according to claim 1, wherein said RFID tag and sensor module further comprises a power unit adapted to stabilize voltage within said RFID tag and sensor module.

12. A system according to claim 1, wherein said patch includes at least one micro knife adapted to draw blood from said surface when said patch is pressed on said surface, wherein said surface is the skin surface of a person.

13. A system according to claim 1, wherein said RFID tag and sensor module is formed as an integrated circuit.

14. A system according to claim 1, wherein said patch comprises:

a substrate having a sample input port enabling migration of an analyte by capillary forces; and

at least one testing area integrated with said substrate area and adapted to capture antigens that flow through said testing area.

15. A system according to claim 1, wherein said at least one sensor is a glucose sensor.

16. A system according to claim 1, wherein said at least one sensor is a cardiac sensor.

17. A system according to claim 1, wherein said at least one sensor is a radiation sensor.

18. A system according to claim 1, wherein said RFID tag and sensor module includes at least one attachment point that enables attachment of the RFID tag and sensor module to a structural stress, thereby forming a RFID stress sensor.

19. A system according to claim 1, wherein said patch is disposable.

20. A system according to claim 1, wherein said RFID sensor further includes a power generation module that powers said RFID sensor.

21. A system according to claim 1, wherein said network includes a remote storage and data processing unit adapted to remotely store and analyze data read by said RFID reader.

22. A system according to claim 1, wherein said RFID reader includes a microprocessor adapted to analyze and geolocate said patch.

23. A system according to claim 22, wherein said geolocation occurs through the use of a global positioning system.

24. A system according to claim 1, wherein said RFID tag and sensor module is integrated into an immunoassay testing strip.

25. A human diagnostics system comprising:

a patch having a radio frequency identification (RFID) tag and sensor module, and being attachable to the surface of the skin and adapted to sense predetermined elements through the skin and transmit signals corresponding to said predetermined elements;

a RFID reader communicative with said patch through the use of a network and adapted to analyze, receive, and transmit the signals from said patch through the use of multiple protocols; and

a remote storage and data unit communicative with said RFID reader, said remote storage and data unit analyzing and storing data from said patch and said RFID, said remote storage and data unit transmitting said analyzed and stored data to said RFID reader through the use of said network.

26. A system according to claim 25, further comprising a remote wireless device adapted to remotely access said predetermined elements sensed by said RFID tag and sensor module.

27. A system according to claim 25, wherein said predetermined elements include electrical, chemical, biological, and physical elements of a person.

28. A system according to claim 25, wherein said network is a wireless network that enables communication through the use of a communication protocol including, Bluetooth, Wi-Fi, Broadband, WLAN, and 3G.

29. A system according to claim 25, wherein said RFID reader is a cellular telephone.

30. A personal wireless communications device for communicating with a radio frequency identification (RFID) tag and sensor module, comprising:

a multi protocol RFID reader that is compatible with and adapted to activate said RFID tag and sensor module;

a microprocessor communicative with said RFID reader and adapted to analyze and store data read by said RFID reader; and

at least one antenna coupled to said microprocessor for transmitting and receiving data from said RFID reader, said microprocessor and said RFID tag and sensor module, said antenna being adapted to transmit and receive data from an external device through the use of a network.

31. A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a cellular telephone.

32. A device according to claim 30, wherein said microprocessor is adapted to determine the location of said RFID tag.

33. A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a personal digital assistant (PDA).

34. A device according to claim 30, wherein said external device is a remote storage/data processing unit adapted to analyze, store, and transmit data received from said antenna.

35. A diagnostics system comprising:

a patch having an adhesive portion and adapted to be embedded within a structure;

a radio frequency identification (RFID) tag and sensor module having an integrated temperature module, said RFID tag and sensor module being integrated with said patch and having an antenna and at least one sensor, said RFID tag and sensor module responding to a stimulus by wirelessly transmitting and receiving, through the use of said antenna, signals that correspond to said stimulus; and

a wireless RFID reader communicative with said RFID tag and sensor module, said reader being adapted to communicate over a network through the use of multiple protocols.

36. A system according to claim 35, wherein said stimulus is a defect in said structure.

37. A system according to claim 35, wherein said stimulus is the presence of insects within said structure.

38. An immunoassay test strip system for use in conducting diagnostic measurements comprising:

a substrate that forms a test strip;

at least one test area located on said substrate for capturing antigens; and

a radio frequency identification (RFID) tag and sensor module integrated with said substrate, said RFID tag and sensor module being adapted to sense and transmit signals that correspond to the antigens captured by said at least one test area.

39. An immunoassay test strip according to claim 38, further comprising a wireless reader adapted to receive and process signals from said RFID tag and sensor module through the use of multiple protocols.

40. An immunoassay test strip according to claim 39, wherein said wireless reader is a cellular telephone.

41. An immunoassay test strip according to claim 38, wherein said RFID tag and sensor module includes a temperature sensor.

42. An immunoassay test strip according to claim 38, wherein said test strip is disposable.

43. An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative protein measurements.

44. An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative biomarker measurements.

45. An immunoassay test strip of claim 38, wherein said test strip forms a disease-specific sensor device.

46. An immunoassay test strip of claim 38, wherein said test strip is adapted to perform pre-disease specific tests.

47. An immunoassay test strip of claim 38, being adapted to perform drug toxicity tests.

48. A method of manufacturing a pathogen-specific radio frequency identification (RFID) tag and sensor module, comprising the steps of:

providing a substrate;

printing conductive leads on said substrate wherein said conductive leads define a sensor area;

printing a protective cap doped with a material that is sensitive to pathogen-specific enzymatic action within said sensor area;

printing an antenna on said substrate; and

integrating an RFID tag and sensor module with said substrate.

49. A multi-function personal wireless communications device capable of wireless diagnostics through communication with at least one radio frequency (RF) addressable sensor having a radio frequency identification tag and sensor unit, comprising:

a user interface for receiving an input from a user and transmitting signals corresponding to said input;

a multi-protocol RF reader adapted to receive said input signal, said RF reader adapted to retrieve a unique identification of the RF addressable sensor and downloading software that enables reading and analyses of the RF addressable sensor;

a controller having memory storage and being adapted to process and transmit signals received by said RF reader; and

at least one antenna configured to receive signals from the RF addressable sensor and transmit signals from said controller and said RF reader.

50. The multi-function personal wireless communications device of claim 49, wherein said communications device is adapted to geolocate the at least one RF addressable sensor.

51. The multi-function personal wireless communications device of claim 49, wherein the wireless communications device is a cellular telephone.

52. The multi-function personal wireless communications device of claim 49, wherein said multi-protocol RF reader downloads software that enables reading and analyses of the RF addressable sensor from a remote database.

53. The multi-function personal wireless communications device of claim 49, wherein the device is a PDA.

54. The multi-function personal wireless communications device of claim 49, wherein said user interface includes a preconfigured button for initiating a read of the RF addressable sensors.

55. The multi-function personal wireless communications device of claim 49, further comprising a means for receiving sensor processing information over the communications network.

56. The multi-function personal wireless communications device of claim 49, further comprising a means for connecting a removable sensor module; wherein said removable sensor module provides at least one sensor with a means for monitoring a given health function or for detecting the presence of a harmful agent in the atmosphere.

57. The multi-function personal wireless communications device of claim 56, wherein the controller, network communications means, RF addressable sensor communication means, removable sensor means and user interfaces are integrated onto a single electronic chip.

58. The multi-function personal wireless communications device of claim 57, wherein said single electronic chip is a 3G chipset.

59. A Lab-on-a-Chip microfluidics sensor for conducting rapid diagnostic measurements that are readable directly with a remote wireless RF reader comprising:

conductive leads that enable transmission of signals;

a Lab-on-a-Chip substrate having at least one test area integrated therein and a sensor interface that couples said conductive leads to said test area;

a temperature module integrated with said substrate and adapted to generate signals that correspond to temperature;

an addressable radio frequency (RF) chip having a controller, an RF power source with a voltage stabilization circuit, and a communication interface, said RF chip receiving signals from said conductive leads and said temperature module, said RF chip being adapted to process said conductive lead signals, said temperature module signals and signals from the wireless RF reader; and

at least one antenna adapted to receive signals from the wireless RF reader and said RF chip and transmit signals from said Lab-on-a-Chip microfluidics sensor.

60. The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative protein measurements that are readable directly with the wireless RF reader.

61. The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative biomarker measurements that are readable directly with the wireless RF reader.

62. The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is adapted to perform DNA tests that are readable directly with the wireless RF reader.

63. An immunoassay test strip for conducting an instant diagnostics test using a wireless reader device, wherein the wireless reader device is adapted to communicate over a wireless network, the immunoassay test strip comprising:

at least one test area with an integrated radio frequency chip that is communicative with the wireless device and that provides power to said test area; and

wherein said test area is an electro-immunoassay for measuring the presence and quantity of a biological molecule.

64. An immunoassay test strip according to claim 63, wherein said radio frequency chip is selected from the group consisting of an RFID chip, a Bluetooth chip, a Zigbee chip or an IEEE 1073 chip.